REMARKS

Claims 1-2, 4-7, 9-18 and 21-22 are currently pending. Claims 3 and 8 have been cancelled. New Claim 22 has been added. Support for new Claim 22 can be found at page 8, ¶ 1 of the specification and in Figures 3-8. Applicants thank the Examiner for his withdrawal of the rejections. Applicants also thank the Examiner for the courtesies extended to the undersigned attorney for applicants during a telephone conference during which the Examiner clarified his position regarding his interpretation of the Rhodes reference. Applicants believe that, as presently amended, the Claims present novel claimed subject matter over the prior art of record.

Claim 1 has been amended to recite a tube wherein "the directing elements in each laterally extending row of each surface structure" are "substantially parallel to the directing elements in the succeeding row of the succeeding surface structure on the opposing primary surface in the longitudinal direction of the tube." Claim 1 has also been amended to recite a tube wherein "said surface structure further compris[es] a laterally extending second row of mutually parallel directing elements, the directing elements of the second row being arranged at an angle (γ) relative to the directing elements of the first row" and "wherein a line describing a longitudinal edge of each directing element in the first row is substantially tangent to a tip of each directing element in the second row." As an example not meant to restrict the scope of Applicants' Claim 1, an example of such a structure can be found in Applicants' Figures 4 and 10. As can be seen in these Figures, elongated elements in a laterally extending row (in solid lines) are arranged to be substantially parallel to the elements in a succeeding row of directing elements (in dashed lines) on the opposing primary heat transfer surface in the longitudinal direction of the tube. Additionally, in Figures 4 and 10, if one were to extend the line describing the lower "edge" of the directing elements in the first row in the surface structure, those lines

would "extend" to be tangent to the rounded tips of directing elements in the second row of the surface structure. This particular arrangement of directing elements enables a plurality of spiral flows to occur in the longitudinal direction of the tube.

A replacement drawing sheet has been submitted. In particular, Figure 2 has been corrected to reverse the direction of the spiral flow, as described in the specification at page 3, lines 14-22.

Claim 8 was objected to under 37 C.F.R. § 1.75(c). Applicants have elected to cancel Claim 8, and therefore respectfully request for the objection to be withdrawn.

Former Claims 1-18 have been rejected under 35 U.S.C. 112. Claim 3 has been cancelled and Claim 1 has been amended to remove the recitation of "in each laterally extending row of each surface structure being parallel to the directing elements." Claim 1 has also been amended to provide antecedent basis for "said angle," in Claims 7 and 15-16. Applicants believe that these amendments obviate the bases for the Examiner's rejection, and accordingly respectfully request for the rejection to be withdrawn.

Former Claims 1-18 and 21 have been rejected as being anticipated by, and/or obvious in view of U.S. Patent No. 4,470,452 to Rhodes ("Rhodes"). Applicants respectfully traverse the rejection. Applicants submit that Rhodes does not disclose, teach or suggest their invention as presently claimed. The Final Action dated February 11, 2002, stated that:

> Rhodes "indentations" arranged in a "herringbone" are disclosed as successively arranged on opposed primary surfaces. It is believed that each "herringbone" is a surface structure. As clearly shown in Prior Art Figure 2 and the Figures 3 and 6, the invention "as a whole" is a series of rows of indentations 152 successively arranged on opposed primary surfaces in the longitudinal direction.
>
> When read in context of the entire passage (column 6, lines 10-33), Rhodes discloses the staggered spacing as in applicants' instant invention as claimed. Spacing and arrangement is not critical to the extent that it does not affect the crowning or bowing of the tube.

> The claims are rejected in anticipation by Rhodes. The similar structure will function in a manner similar to the claimed invention. There is no requirement that the reasons or problems to be solved by Rhodes needs to be the same as applicants'.

See Office Action, p. 4-5.

Applicants respectfully submit that the precise structure as claimed in Claim 1, as presently amended, is not taught or suggested by Rhodes. Rhodes does disclose that surface structures can be placed on opposing heat transfer surfaces in an alternating manner. Rhodes also discloses a "herringbone" pattern as a possible surface structure to be so placed. However, Rhodes is devoid of any teaching at all as to how elongate "indentations" should be oriented in one surface structure relative to another when placed on those surfaces.

Rhodes does not disclose a Figure similar to Figures 2 or 3 showing how the indentations are to be placed on one primary heat exchange surface relative to another. As claimed in amended Claim 1, the elongate directing elements in a given row must be substantially parallel to the elongate directing elements in the succeeding row in the succeeding surface structure on the opposing primary heat transfer surface in the longitudinal direction of the tube.

Since, Rhodes does not explicitly disclose how the elongate elements are to be arranged on one surface with respect to another, in order for a rejection of the Claim 1 as amended to be proper, it must be shown that Rhodes inherently discloses, teaches or suggests Applicants' invention as claimed in order for a rejection of Claim 1 to be properly based thereon. However, to base a rejection of Claim 1 as amended on principles of inherency, the allegedly inherent characteristics must necessarily flow from the teachings of Rhodes.

Applicants respectfully submit that Rhodes does not distinguish between placing the herringbone surface structures in a manner such that the elongate elements in succeeding

rows are substantially parallel to one another, or in an opposite manner (such as if they were arranged obliquely with respect to one another, as in a single surface structure). If the indentations in a given row were not substantially parallel (e.g., if they were perpendicular) to the indentations in the succeeding row of the succeeding surface structure on the opposing primary surface, the novel spiral flow characteristic of Applicants' claimed invention could not occur, since the necessary flow path would not exist. Only when these indentations are arranged to be substantially parallel can they act as "directing elements" (i.e., elements that direct the flow) and permit spiral flow to develop in a given heat transfer tube.

There is an additional reason that Rhodes cannot anticipate or render obvious Applicants' invention as now claimed. Figure 7 of Rhodes does not teach or suggest a "laterally extending second row of mutually parallel directing elements" that are "arranged at an angle (γ) relative to the directing elements of the first row" wherein "a line describing a longitudinal edge of each directing element in the first row is substantially tangent to a tip of each directing element in the second row."

Figure 7C of Rhodes shows first and second rows of indentations that are arranged at an angle with respect to one another. In Figure 7, if either edge of the indentations in the first row were extended they would intersect the indentations of the second row, not be substantially tangent to the tips thereof as required by Claim 1. This arrangement would probably just result in turbulence, and not spiral flow. Stated another way, the structure of Rhodes is different than that now claimed by Applicants, and there is no motivation or teaching in Rhodes to change the arrangement of those directing elements in any way for any reason. If one skilled in the art were to arrive at Applicants' claimed invention using the disclosure of Rhodes, it would necessarily be by accident. In fact, the only way that one skilled in the art could arrive at Applicants' invention as claimed in Claim 1 would require that Applicants'

specification be used as a roadmap. Any rejection of Claim 1 on this basis would be improper, because it necessarily relies on hindsight. Thus, Rhodes does not teach or suggest all of the elements of Claim 1, as amended.

Since Claims 2, 4-7 and 9-18 depend from Claim 1, they, too, cannot be anticipated by Rhodes. Claims 21 and 22 are directed toward a means for creating a spiral flow and a method for accomplishing the same, respectively. Since Applicants' invention as claimed in Claim 1 is not inherently taught or suggested by Rhodes, Applicants respectfully submit that Rhodes does not teach or suggest a means or method for a fluid conveying tube that creates a spiral flow. Applicants' respectfully request for the rejections under 35 U.S.C. § 102(b) and 35 U.S.C. § 103(a) based on Rhodes to be withdrawn as to Claims 1-2, 4-7, 9-18 and 21, and that Claim 22 similarly be allowed.

CONCLUSION

For these reasons, it is believed that Claims 1-2, 4-7, 9-18 and 21-22, as presently amended, are patentable, and that this application is in allowable condition.

Respectfully submitted,

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APPENDIX 1

(Version With Markings To Show Changes Made In The Claims)

IN THE CLAIMS

1. (Three Times Amended) A fluid conveying tube for vehicle coolers, which on its interior comprises:

first and second opposing longitudinal primary heat-exchange surfaces, said surfaces [being substantially planar and] having flow-directing surface structures[,];

each surface structure extending laterally across said primary surfaces, each surface structure comprising at least one row of elongate directing elements, said elongate directing elements being arranged obliquely with respect to the longitudinal direction of the primary surfaces, said elongate directing elements in each row being mutually parallel[,];

said surface structures being alternatingly arranged in the longitudinal direction on the first and second primary surfaces, the directing elements in each laterally extending row of each surface structure being substantially parallel to the directing elements [in each laterally extending row of each surface structure being parallel to the directing elements] in the succeeding row of the succeeding surface structure on the opposing primary surface in the longitudinal direction of the tube;

said surface structure further comprising a laterally extending second row of mutually parallel directing elements, the directing elements of the second row being arranged at an angle (γ) relative to the directing elements of the first row;

wherein a line describing a longitudinal edge of each directing element in the first row is substantially tangent to a tip of each directing element in the second row.

--22. (New) A method of effecting heat transfer in a heat exchanger, comprising:

introducing a plurality of partial flows into a heat exchanger tube with first and second opposing longitudinal primary heat-exchange surfaces, the tube defining a longitudinal axis and

imparting to each of said partial flows a swirling motion about the longitudinal axis.--